

# PSEUDOMONAS: Molecular Biology and Biotechnology

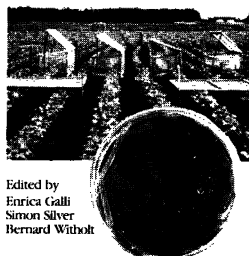
Edited by **Enrica Galli**, *University of Milan, Milan, Italy*; **Simon Silver**, *University of Illinois, Chicago*; and **Bernard Witholt**, *University of Groningen, Groningen, The Netherlands*

*A summary of current research on an important bacterial genus and a signpost for trends in the development of modern microbiology*

PUBLISHED by ASM in cooperation with the Federation of European Microbiological Societies (FEMS), this new book gathers and summarizes the latest developments in international research on *Pseudomonas* species. The contributors are representative of the science from many countries. Areas of emphasis include the molecular biology, biotechnological and industrial applications, and involve-

## Pseudomonas

Molecular Biology and Biotechnology



Edited by  
Enrica Galli  
Simon Silver  
Bernard Witholt

ment in human and plant pathogenesis of pseudomonads. Chapters expand on the initial presentations of world experts at the Third International Symposium (Trieste, Italy, June 1991). These contents will be important for anyone interested in the various abilities and uses for pseudomonads. Students and workers concentrating on related groups of bacteria who need to understand how modern microbiology is developing,

including such controversial topics as environmental release of genetically engineered microorganisms, will find this book a useful signpost.

### CONDENSED CONTENTS

*Pseudomonas* in the Late Twentieth Century (B. W. Holloway); A Common System of Nomenclature for the Physical Map of the Chromosome of *Pseudomonas aeruginosa* PAO (Tümmler et al.)

**Part 1. Bacterium-Plant Interactions** (6 chapters by Lugtenberg et al., Hirano and Upper, Leong et al., Vivian, Durbin, and Bender et al.)

**Part 2. Molecular Mechanisms of Animal Pathogenicity** (4 chapters by Maharaj et al., Goldberg, Lazdunski et al., and Visca et al.)

**Part 3. Taxonomy and Identification** (3 chapters by Palleroni, Höfle, and Schleifer et al.)

**Part 4. Cell Envelope and Transport** (5 chapters by Feingold, Nikaido, Quinn, Coleman et al., and Bellido et al.)

**Part 5. Metabolism and Regulation** (9 chapters by Haas et al., Cuypers and Zumft, MacGregor et al., Drew and Wilson, Kok et al., Harayama et al., Golovleva et al., Palmer et al., and Ronald et al.)

**Part 6. Biotechnology: Biodegradation and Industrial Products** (6 chapters by Furukawa et al., Galli et al., Pieper et al., Imai et al., Witholt et al., and Steinbüchel et al.)

**Part 7. Biotechnology: Manipulation, Cloning, and Vectors** (4 chapters by Boronin, Williams et al., Nakazawa et al., and Dehò et al.)

**Part 8. Rhodobacter: a Photosynthetic Pseudomonad** (3 chapters by Kaplan and Lee, Drews et al., and Vignais et al.)

**Part 9. Environmental Release** (4 chapters by Lindow, Dowling et al., de Lorenzo and Timmis, and Duque et al.)

Estimated publication date: July 1992. Hardcover (ISBN 1-55581-051-9), approximately 456 pages, illustrated, color plates, index. Prices: Member (ASM, FEMS), \$79.00; Nonmember, \$89.00. Canadian prices (include 7% G.S.T.): Member (ASM, FEMS), \$84.53; Nonmember, \$95.23. Shipping charges: U.S., 1-3 copies = \$2.50/book; 4+ copies = \$1.75/book. Non-U.S., 1-3 copies = \$4.50/book; 4+ copies = \$2.25/book. Offer Number: 2LAS7-051-9. Please specify this number when ordering.

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## Journal of Bacteriology

You are accustomed to keeping up-to-date with the *Journal of Bacteriology*—but are you aware of recent important changes in the journal?

A new, more contemporary cover and table of contents launch the 1992 subscription year, reflecting the journal's ongoing commitment to being at the cutting edge of research in its area. One or more minireviews will be featured in each issue. These popular articles summarize developments in fast-moving areas and are invaluable to busy researchers who have limited time for extensive reading.

The twice-monthly publication instituted last year means you get more science more quickly—and that's what keeping up-to-date is about in the 90s. Also, the journal continues to print on acid-free paper to preserve its archival content for the future.

The scope of the *Journal of Bacteriology* continues to reflect its status as the leading periodical, worldwide, devoted to the advancement of fundamental knowledge concerning bacteria and other microorganisms. Articles in the following subject areas are included: structure and function, plant microbiology, cell surfaces, eukaryotic cells, genetics and molecular biology, population genetics and evolution, plasmids and transposons, bacteriophages, physiology and metabolism, enzymes and proteins, and physical mapping of the *E. coli* chromosome.

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## JOURNAL OF BACTERIOLOGY

VOL. 154, NO. 1  
JANUARY 1992



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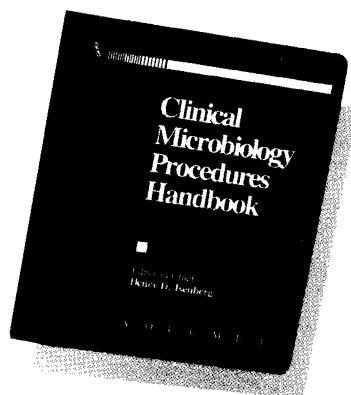


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# Clinical Microbiology

*Editor in Chief: Henry D. Isenberg*



*From the publishers of the **Manual of Clinical Microbiology** and the **Manual of Clinical Laboratory Immunology** - a new procedural handbook written and designed for laboratory supervisors and technologists*

This unique handbook published by ASM provides nearly 2,500 pages of comprehensive, up-to-date, and detailed procedural information designed for step-by-step bench-level use in any clinical laboratory performing microbiological and immunological procedures.

Extremely ambitious in its scope, **CMPH** has been written in response to the growing need for a practical bench-level "cookbook" for the laboratory technologists responsible for producing accurate results in clinical microbiology labs.

**More than 200 dedicated clinical scientists, laboratory supervisors, and technologists** across the United States have researched and reviewed the procedures described in the **Clinical Microbiology Procedures Handbook**. They have drawn on their on-the-job experience and extensive resources to make **CMPH** the single most effective tool to advance the goal of all clinical microbiology laboratories: the accurate and timely provision of pertinent information essential for the diagnosis of infectious diseases and the choice of therapy for patients.

The contributors' tireless efforts have resulted in a clear, concise, and inclusive handbook. Designed for daily use, this superb resource will become the cornerstone for successful microbiological analysis of clinical specimens.

## Step-by-step instructions

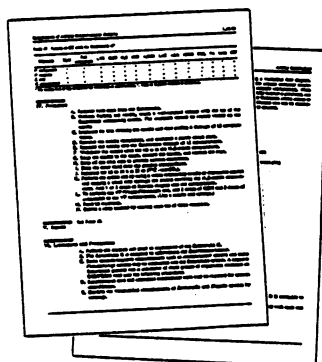
Designed with document GP2-A of the National Committee for Clinical Laboratory Standards (NCCLS) and the Clinical Laboratory Improvement Amendments of 1988 (CLIA '88) in mind, each procedure discusses (whenever applicable): (i) **the underlying principle of the test**; (ii) **the specimen, with definitions of acceptable submissions and directions for proper collection, transport, etc.**; (iii) **materials, including reagents and their preparation, supplies, and equipment**; (iv) **quality control**; (v) **procedure**; (vi) **results**; (vii) **reporting**; (viii) **procedure notes**; and (ix) **limitations**.

## Sections (editors)

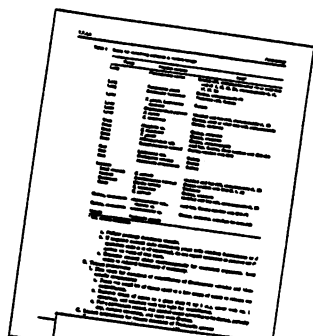
1. Aerobic Bacteriology (Marie Pezzlo)
2. Anaerobic Bacteriology (James I. Mangels)
3. Mycobacteriology (Ronald N. Master)
4. Aerobic Actinomycetes (Michael R. McGinnis)
5. Antimicrobial Susceptibility Testing (Janet Hindler)
6. Mycology (Michael R. McGinnis)
7. Parasitology (Lynne S. Garcia)
8. Virology (Lorraine M. Clarke)
9. Immunology (Alan Landay and James D. Folds)
10. Molecular Biology (Fred C. Tenover)
11. Epidemiologic and Infection Control Microbiology (Mary Gilchrist)
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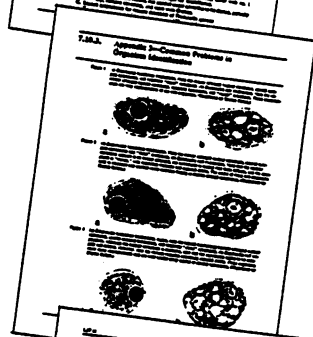
# Procedures Handbook



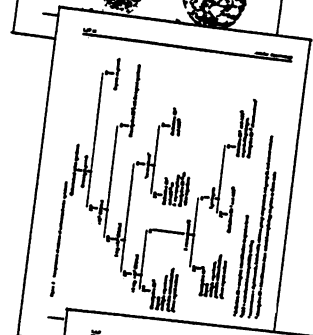
It's easy to follow the step-by-step instructions for each procedure. The language is straightforward and "user friendly." The 'Procedure Notes' often have quick tips for evaluating the results.



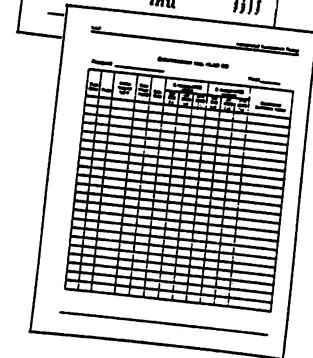
Over 300 tables provide further details at a glance whether they are identification charts, results of standard tests, or recommended media. The information provides shortcuts for bench-level analysis and decision making.



Numerous figures and diagrams illustrate various procedures, results from cultures, and equipment technology. Laboratory technologists can rapidly verify the proper techniques for handling test tubes and slides. Or compare their results with pictures from the book.



Flowcharts clearly illustrate the distinct paths leading to a correct diagnosis.



Every lab must keep track of results and equipment maintenance. Used in labs across the country already, the worksheets are designed for clarity and completeness. They may be used as they are or adapted to your lab's particular need.

Written by experienced technologists who actually work at the bench, **CMPH** is filled with tips about the tricks of the trade that facilitate the performance of tests or preparation of reagents. When indicated, guides to the interpretation of results are also provided. Three sections are devoted entirely to issues of quality control and assessment, instrument maintenance, and safety.

To aid in the analytical process, the contributions are accompanied by tables, figures, appendixes that supplement procedures, references, and suggestions for supplemental reading, information, or names and addresses of manufacturers and suppliers.

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While **CMPH** covers nearly every procedure a laboratory performs, its loose-leaf format allows easy adaptation and modification for your laboratory's specific requirements. **This format also permits future additions keeping your initial purchase up-to-date throughout the years.** Supplements will be published (sold separately) and cross-referenced to the core text. Timely bulletins will alert users of any procedural changes or recommendations that warrant immediate attention.

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*An important, much-needed update on a major food-borne pathogen of humans...*

# CAMPYLOBACTER JEJUNI

## CURRENT STATUS AND FUTURE TRENDS

Edited by Irving Nachamkin, *University of Pennsylvania School of Medicine, Philadelphia*; Martin J. Blaser, *Vanderbilt University School of Medicine, Nashville, Tennessee*; and Lucy S. Tompkins, *Stanford University School of Medicine, Stanford, California*

**D**uring the past decade, *Campylobacter jejuni* has gained recognition as probably the most common cause of sporadic bacterial diarrheal illness in the United States and a pathogen of considerable importance worldwide. *Campylobacter* enteritis is essentially a food-borne disease, and the principal vehicle of infection is raw or undercooked meat, primarily poultry, although numerous other factors have been identified. Approximately 2.4 million cases of the disease are estimated to occur annually in the United States.

This book, the first major text on *Campylobacter* infections in over 8 years, summarizes the major advances in understanding the clinical disease and epidemiology of infection which have occurred in recent years. Scientists have begun to examine the biology and pathogenesis of *C. jejuni* infection, and new genetic approaches should enable significant progress in the near future.

Persons working in *Campylobacter* research, microbial pathogenesisists, clinical microbiologists, public health researchers, and infectious disease specialists will all find this a stimulating resource and an important update on the topic.

### CONDENSED CONTENTS

**Part I. Clinical and Epidemiologic Aspects** (4 chapters by Skirrow and Blaser, Tauxe, Taylor, and Mishu *et al.*)

**Part II. Reservoirs and Antimicrobial Resistance** (5 chapters by Doyle and Jones, Stern, Norcross *et al.*, Tenover *et al.*, and Taylor)

**Part III. Clinical Microbiology** (3 chapters by Kaijser and Megraud, Goossens and Butzler, and Patton and Wachsmuth)

**Part IV. Pathogenesis of *Campylobacter* Infections** (9 chapters by Fox, Walker *et al.*, Russell, Ruiz-Palacios, Guerrant *et al.*, Fanchère *et al.*, Palacios *et al.*, Perez-Perez *et al.*, and Konkel *et al.*)

**Part V. Immune Responses and Antigenic Analysis** (6 chapters by Newell and Nachamkin, Black *et al.*, Nachamkin and Yang, Mills *et al.*, Blaser and Perez-Perez, and Pei *et al.*)

**Part VI. Molecular Pathogenesis** (4 chapters by Tompkins, Taylor, Guerry *et al.*, and Nuijten *et al.*)

June 1992. Hardcover (ISBN 1-55581-042-X), 312 pages, illustrated, index.

**Prices:** Member, \$65.00; Nonmember, \$79.00. **Canadian prices** (include 7% G.S.T.): Member, \$69.55; Nonmember, \$84.53.

**Shipping charges:** U.S., 1-3 copies = \$2.50/book; 4+ copies = \$1.75/book. Non-U.S., 1-3 copies = \$4.50/book; 4+ copies = \$2.25/book.

**Offer number:** MR 9/92-042-X.

### *Campylobacter jejuni*

#### Current Status and Future Trends

Edited by  
Irving Nachamkin, Martin J. Blaser,  
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# CASES IN MEDICAL MICROBIOLOGY & INFECTIOUS DISEASES

Peter H. Gilligan, Daniel S. Shapiro, M. Lynn Smiley  
University of North Carolina School of Medicine, Chapel Hill

**D**esigned as a supplement for traditional medical microbiology texts, **CASES IN MEDICAL MICROBIOLOGY AND INFECTIOUS DISEASES** challenges students on their working knowledge of the various disciplines of medical microbiology, including bacteriology (34 cases), mycology (9 cases), parasitology (7 cases), and virology (16 cases). The authors have developed case histories of patients seen at a major university teaching hospital whose cases represent either typical infections caused by commonly encountered organisms or life-threatening or fatal infections caused by less frequently encountered organisms.

Cases are presented as "unknowns" and are accompanied by key questions, testing knowledge in four broad areas:

1. Organism characteristics and laboratory diagnosis
2. Pathogenesis and clinical characteristics
3. Epidemiology
4. Prevention and therapy

Detailed discussions are given on the pages following each case. In many of the cases, microscopic descriptions of the organisms are given so that the differential diagnosis can be narrowed. A list of organisms to be considered as possible etiologies of infection in the cases is found at the end of each section. Color slides illustrate organisms in detail. A glossary of clinical terms is included.

## Table of Contents

Bacteriology
Cases 1-34
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Mycology and Parasitology
Mycology: Cases 35-43
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Parasitology: Cases 44-50
Table 3. Medically Important Parasites
Virology
Cases 51-66
Table 4. Medically Important Viruses
Table 5. Table of Normal Values
List of Figures
Glossary of Medical Terms
Index of Key Terms by Case

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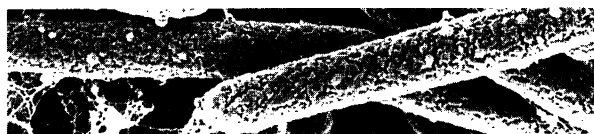
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# Microbial Cell-Cell Interactions



Edited by **Martin Dworkin**,  
*University of Minnesota, Minneapolis*

**T**his well-considered compilation of reviews and discussions has as one central theme that the historical concept of microbes as essentially unicellular organisms existing independently of other organisms is conceptually incomplete and misleading; instead, microbial systems manifest a variety of cell-cell interactions and a real understanding, not only of the role of the microbe in nature but also of the nature of the microbe itself, requires that researchers begin to think of microbes as interacting biochemically, genetically, and physiologically with each other. Thus considered, it becomes apparent that the variety of cell-cell interactions manifested by microbial systems represent excellent model systems for examining the mechanistic bases of the cell-cell interactions themselves, with application to the study of multicellular interactions in higher organisms. The authors provide a representative sampling of the types of interactions among microbes, including mating interactions, developmental interactions, ecological/colonization interactions, and predator-prey interactions.

This book is directed toward any microbiologist who must deal in a practical sense or in a research context with cell-cell interactions, as exemplified by examinations of mechanisms of pathogenesis, ecological interactions, mechanisms of mating, developmental biology, predator-prey interactions, plant-microbe interactions, and formation of mixed culture communities.

## CONTENTS

1. **Introduction** (*Dworkin*); 2. **Mating Interactions in Gram-Positive Bacteria** (*Dunny*); 3. **Conjugation among Enteric Bacteria** (*Ippen-Ihler and Maneewannakul*); 4. ***Chlamydomonas* Mating Interactions** (*Goodenough*); 5. **Cell-Cell Interactions Involved in Yeast Mating** (*Kurjan*); 6. **Intercellular Interactions during *Dictyostelium* Development** (*Schaap*); 7. **Cell-Cell Interactions in Myxobacteria** (*Dworkin*); 8. **Role of Intercellular Chemical Communication in the *Vibrio fischeri*-Monocentrid Fish Symbiosis** (*Dunlap and Greenberg*); 9. **Rhizobium-Legume Symbiosis** (*Roth and Stacey*); 10. **Coaggregation: Adherence in the Human Oral Microbial Ecosystem** (*Kolenbrander*); 11. **Intercellular Signalling in the *Bdellovibrio* Developmental Cycle** (*Gray and Ruby*)

November 1991. Hardcover (ISBN 1-55581-037-3). 382 pages, illustrated, index.

**Prices:** Member, \$59.00; Nonmember, \$69.00. **Canadian prices (include 7% G.S.T.):** Member, \$63.13; Nonmember, \$73.83. **Shipping charges (orders postmarked after 31 December 1991):** U.S., 1-3 copies = \$2.50/book; 4+ copies = \$1.25/book. Non-U.S., 1-3 copies = \$4.50/book; 4+ copies = \$2.25/book. **Offer number:** MR-037-3.

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# Immunochemical Assays and Biosensor Technology for the 1990s

Edited by **Robert M. Nakamura**, *Scripps Clinic and Research Foundation and University of California, San Diego, School of Medicine, La Jolla*; **Yasushi Kasahara**, *Fujirebio, Inc., Tokyo, Japan*; and **Garry A. Rechnitz**, *University of Hawaii, Honolulu*

**I**mmunochemical assays, fundamental measurement methods in biomedical research and analysis, have recently undergone revolutionary change and development deriving from innovations in the use of nonisotopic labels and in the marriage of biochemistry with electronics. Other assays in the developmental phase hold even greater promise for improved testing efficiency and for decentralization of these complex and sensitive laboratory procedures.

This volume summarizes the principles and applications of fundamental immunochemical assays, various assay formats, and the current state of the art in ultrasensitive and nonisotopic assays. It is intended primarily for anyone working with immunochemical assays who wants a comprehensive view of options now available as well as a glimpse at likely improvements which will occur in this decade. Students and practitioners of modern analytical techniques in immunology, clinical chemistry, diagnostic microbiology, serology, and medical technology will especially benefit.

## CONDENSED CONTENTS

**I. Concepts of Immunochemical Assays** (5 chapters by *Nakamura, Houanitz, Kricka, McCormack et al.*, and *Feldkamp*)

**II. Nonisotopic Immunochemical Assays** (8 chapters by *Ritchie, Kasahara, Nakamura and Kasahara, Kasahara, Ishikawa, Nakamura, Bronstein and Sparks*, and *Diamandis and Christopoulos*)

**III. Biosensors** (7 chapters by *Ho and Rechnitz, Xu et al.*, *Arnold, Yacynych, Wotring et al.*, *Belli*, and *Eldefrawi et al.*)

January 1992. Hardcover (ISBN 1-55581-040-3). 421 pages, illustrated, index.

**Prices:** Member, \$43.00; Nonmember, \$51.00.

**Canadian Prices** (include 7% G.S.T.): Member, \$46.01; Nonmember, \$54.57.

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## Genetics and Molecular Biology of Streptococci, Lactococci, and Enterococci

Edited by Gary M. Dunny, *University of Minnesota, St. Paul*; P. Patrick Cleary, *University of Minnesota Medical School, Minneapolis*; and Larry L. McKay, *University of Minnesota, St. Paul*

This new book summarizes the current state of streptococcal genetics research being conducted by microbial geneticists and medical, dental, veterinary, and food microbiologists around the world. Its intended audience includes researchers and educators working in the above disciplines and scientists developing and applying this research in the food, pharmaceutical, biotechnological, and vaccine industries.

Also presented is valuable reference information on genetic techniques such as electroporation, cloning vectors, and other essential guidance for researchers working on streptococci and other gram-positive bacteria.

This book had its origin in the 3rd International ASM Conference on Streptococcal Genetics, June 1990.

**Condensed Contents:** I. Gene Transfer (*11 chapters*). II. Molecular and Genetic Analysis of Pneumococci (*7 chapters*). III. Lactococci: Molecular Biology and Biotechnology (*9 chapters*). IV. Structure and Evolution of the M-Protein Gene Family (*7 chapters*). V. Extracellular Products of Pathogenic Streptococci: Genetics and Regulation (*12 chapters*). VI. Molecular Biology of Oral Streptococci (*12 chapters*).

**Ordering information:** June 1991. Hardcover (ISBN 1-55581-034-9), 318 pages, illustrated, index. Member, \$59.00; Nonmember, \$69.00 (Canadian customers add 7% G.S.T.). Shipping charges: U.S., \$2.50/book (1-3 copies) or \$1.75/book (4+ copies); non-U.S., \$4.50/book (1-3 copies) or \$2.25/book (4+ copies). When ordering, specify order number MR-034-9. Charge card orders may also be placed by telephone [(202) 737-3600] or by fax [(202) 737-0368].



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*Autoimmunity, Immunodeficiency, Malignancy*

## Viruses That Affect the Immune System

Edited by Hung Y. Fan, *Cancer Research Institute, University of California, Irvine*; Irvin S. Y. Chen, *UCLA School of Medicine, Los Angeles, California*; Naomi Rosenberg, *Tufts University School of Medicine, Boston, Massachusetts*; and William Sugden, *McArdle Laboratory, University of Wisconsin, Madison*

Viral infections in humans or animals almost always affect the host's immune system. Some viruses can infect immune system cells, causing abnormalities such as autoimmunity, malignancy, or immunodeficiency. These major immune system abnormalities and the viruses that produce them compose the focus of this volume, the third in a popular series arising from the ICN-UCI Conferences on Virology.

The book commences with the editors' introductory overview of the major immune system viruses, the retroviruses and the herpesviruses. Four comprehensive sections follow, covering molecular genetics, pathogenic and genetic mechanisms, structures and functions of viral and cell proteins, animal models, and cell culture systems for immune system virus research. Human and other immunodeficiency viruses, retroviruses including human and murine leukemia viruses, Epstein-Barr virus, and cytomegalovirus are among the pathogens examined in depth.

Molecular biologists, virologists, and researchers into oncology, autoimmunity, and the immunodeficiency syndromes will find this book a valuable addition to the literature.

### CONDENSED CONTENTS

- I. Overview (Fan et al.)
- I. Autoimmunity (Oldstone)
- II. Immunodeficiency by Retroviruses (Wong-Staal; Dinter et al.; Camerini and Chen; Diamond et al.; Page et al.; and Jolicœur et al.)
- III. Oncogenesis by Retroviruses (Temin et al.; Kelliher et al.; Fan et al.; Coffin et al.; and Greene et al.)
- IV. Oncogenesis by Herpesviruses (Sugden; Speck; and Nelson et al.)

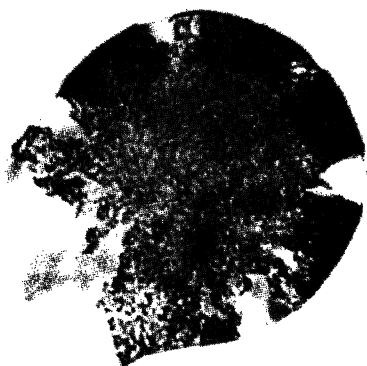
Hardcover (ISBN 1-55581-032-2), May 1991. 264 pages, illustrated, index. Member, \$49.00; nonmember, \$62.00 (Canadian customers add 7% G.S.T.). Shipping charges: U.S., \$1.50/book (1-3 copies) or \$0.75/book (4+ copies); non-U.S., \$2.50/book (1-3 copies) or \$1.25/book (4+ copies).

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# Microbial Cell Surface Hydrophobicity

Edited by **R. J. Doyle**, *University of Louisville, Louisville, Ky.*, and **Mel Rosenberg**, *Tel Aviv University, Ramat Aviv, Israel*

Despite the voluminous journal literature on the hydrophobicity of microorganisms, its structural basis, and its role in microbial adhesion to surfaces, in differentiation, and in morphogenesis, this is the first book devoted to this subject. There has been a growing realization that hydrophobic interactions play a role in many, if not most, microbial adhesion phenomena, including microbial adhesion to soft host tissues, implants and prostheses, contact lenses, glass, oil, steel, teeth, submerged aquatic surfaces, plants, and fish.

This monograph covers in clear detail the hydrophobicities of fungi, especially *Candida* spp., and of staphylococci, streptococci, oral bacteria, soil and aquatic bacteria, the *Enterobacteriaceae*, and other Gram-negative bacteria. Each chapter is richly referenced, for those interested in delving further into a specific topic. The authors in this book were selected based on their substantial contributions to the field. Medical, applied, and environmental microbiologists; environmental, microbial, and petroleum engineers; infectious-disease physicians and researchers; and oral biologists will all benefit from this excellent summary and review.

## CONTENTS

1. Microbial Cell Surface Hydrophobicity: History, Measurement, and Significance (*M. Rosenberg and Doyle*)
2. Nature of the Hydrophobic Effect (*Duncan-Hewitt*)
3. Microbial Hydrophobicity and Fermentation Technology (*Mozes and Rouxhet*)
4. Role of Hydrophobic Interactions in Microbial Adhesion to Plastics Used in Medical Devices (*Klotz*)
5. Hydrophobicity of Proteins and Bacterial Fimbriae (*Irvin*)
6. Adhesion of Bacteria to Plant Cells (*Smit and Stacey*)
7. Hydrophobicity in the Aquatic Environment (*Bar-Or*)
8. Changes in Bacterial Surface Hydrophobicity during Morphogenesis and Differentiation (*E. Rosenberg and Sar*)

9. Cell Surface Hydrophobicity of Medically Important Fungi, especially *Candida* Species (*Hazen*)
10. Significance of Hydrophobicity in the Adhesiveness of Pathogenic Gram-Negative Bacteria (*Lachica*)
11. Hydrophobic Characteristics of Staphylococci (*Wadstrom*)
12. Relative Importance of Surface Free Energy as a Hydrophobicity Measure in Bacterial Adhesion to Solid Surfaces (*Busscher, Sjollem, and van der Mei*)
13. Hydrophobicity of Group A Streptococci and Its Relationship to Adhesion of Streptococci to Host Cells (*Courtney, Hasty, and Ofek*)
14. Hydrophobicity of Oral Bacteria (*Doyle, M. Rosenberg, and Drake*)

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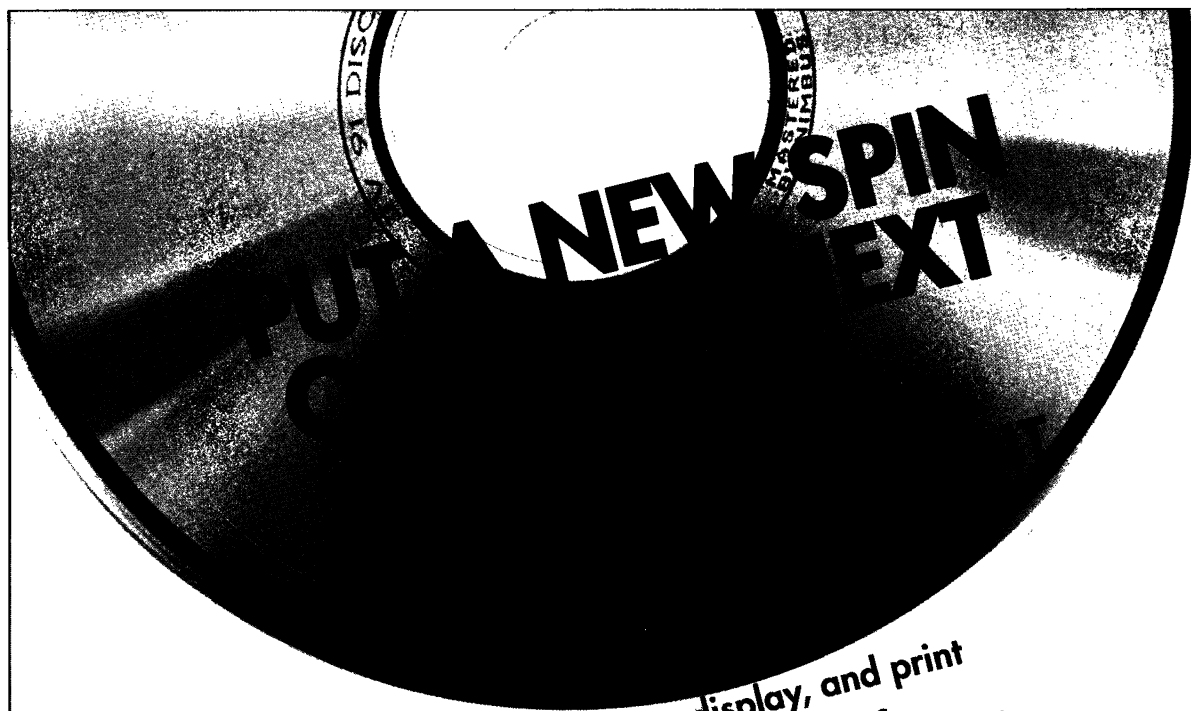
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